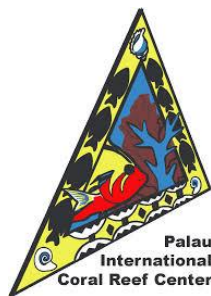


Socio-economic Baseline Study of Ngaraard State



PICRC Technical Report No. 16-07

¹Shirley Koshiba, ²Karen E. McNamara, ¹Marine Gouezo, ¹Evelyn Otto, ¹Randa Jonathan



¹Palau International Coral Reef Center 1 M-Dock Road P.O. Box 7086 Koror, Palau 96940

²The University Of Queensland, St Lucia QLD 4072, Australia

July 2016

Executive Summary

In 2015, the Palau International Coral Reef Center, in collaboration with the University of Queensland, conducted a baseline socio-economic study within six PAN States of Palau. The results presented in this report are based on one of six PAN states: Ngaraard State. The study utilized household questionnaires and key informant interviews incorporating key socio-economic indicators at the regional level (Micronesia Challenge), National level (Palau Indicators) and site level (local management plan).

Results from this study show that most respondents are aware and supportive of the Palau PAN as well as state conservation areas and state bul¹ or traditional form of protective management. While most respondents knew about state and national conservation initiatives, only 53% of respondents were aware of the MC. Two-thirds (66%) of respondents indicated that they participate in fishing related activities, while 82% stated that they or members of their household grow household crops. Most households mainly participate in fishing related activities and farming for food consumption and less for the purposes of income generation. The majority of respondents did not attribute any changes to locally-sourced marine and terrestrial food availability to the protected areas. However, roughly 40% of respondents indicated that the terrestrial protected areas have increased the quality and quantity of freshwater. The majority of respondents were aware of all conservation areas within the Kerradel Conservation Network, while only half of respondents knew of the boundaries of the conservation areas. Less than half of the respondents (41%) have

¹Bul refers to a Palauan traditional form of conservation where certain restrictions are placed to regulate the harvesting of plants or fishing. The bul would only be lifted if the village chiefs or men's clubs observed that the reefs and/or plants were ready to be harvested again.

never participated in natural resource planning and decision making which indicates the need to increase the level of interest and participation of community members in such activities.

Most key informants spoke of the need to raise awareness to the local community members regarding the purpose of the Kerradel Conservation Network, and regularly communicate monitoring results to the community. This would aid in gaining more respect from the community towards the Kerradel Conservation Network. In addition, most key informants spoke of the need to strengthen the level of enforcement of the Kerradel Conservation Network, as well as the need for more equipment, funding, and training for Ngaraard PAN staff in order to improve the adaptive management of Ngaraard's natural resources. Finally some key informants spoke of the need to have alternative sources of livelihoods as a way to lessen the pressure on Ngaraard's marine resources including decreasing the level of illegal entry and fishing within conservation areas. It is recommended that for the next update of the Kerradel Conservation Network management plan, these results can serve as a guideline for revisions and evaluation of the goals and activities of the Kerradel Conservation Network management plan. These results serve as baseline socio-economic data for the Kerradel Conservation Network, however continuous monitoring is needed in order to track trends and changes of protected areas and their associated communities.

Introduction and Context

Socio-economic information provides resource managers and relevant stakeholders' important information to effectively manage protected areas. Within the Micronesia region, the MC serves as an initiative to effectively conserve 30% of near shore and 20% of terrestrial resources across Micronesia by 2020. In Palau a system of protected areas known as the Palau PAN was created with the goal of conserving and sustaining Palau's pristine resources and is Palau's mechanism to achieving the goals of the MC. This study aims to assess the effectiveness of PAN sites in improving the livelihood outcomes of Palau's communities. It does so by conducting a socio-economic study within six PAN States of Palau. The results presented in this report are based on just one of those six states: Ngaraard State.

Veitayaki (1997: 124) notes that 'nearly all of the marine management systems now being tried in contemporary societies were used in some form in traditional Pacific Island management systems'. These have included actions such as closed seasons and/or areas, size and catch limitations, equipment control and prohibitions. The PAN, being implemented across Palau, in many ways pays close tribute to the traditional marine management system – Bul – that was in place for many, many decades.

In a broad brush manner, the literature on implementing protected areas, particularly marine areas, points to their lack of success, especially in developing countries (e.g. Cinner, 2007; Johannes, 2002). While these studies promote a rather grim prognosis for protected areas, ambitious calls to establish more conservations areas globally continue (Mora et al., 2006).

Often, studies on the impact, effectiveness and sustainability of protected areas focus heavily on biological and ecological indicators. While understanding the progress being made in these areas to conserving resources, equally important is understanding the views and perceptions of surrounding local communities – as Johannes (1978) puts it, understanding the viewpoint of the ‘conserver’. This is the core impetus for undertaking this study. Making this study novel is that it builds on a limited knowledge base of empirical data on local people’s behaviours, support for, and perceptions of the protected areas, not only in Palau, but globally (see Bartlett et al., 2009).

Methods and Study Site

Methods

This study utilized a structured household questionnaire administered across six States of Palau: Kayangel, Ngaraard, Ngchesar, Ngiwal, Airai and Peleliu. Within each state is a registered marine and/or terrestrial PAN site. While the aim of this study was to determine a variety of social factors related to marine protected areas, equivalent terrestrial questions were conducted where applicable. This study focused on surveying individuals over 18 years old who could speak on behalf of their household and were considered to be the head of household, being mindful too of the need to try and ensure a gender balance across the sample size. To do so, the local data collectors asked if either the male or female head of household was available to be surveyed.

This data collection method was deemed most appropriate and efficient in collecting a large sample size across a broad geographical area. The main objectives of the household questionnaire were to ascertain:

- Socio-demographic data on the respondent and their household;
- Livelihood activities and household income levels;
- Food and water security at the household level; and
- Individual views on the Conservation Areas in their State.

Each question attempted to align with some of the indicators set by the Micronesia Challenge, Palau Indicators and PICRCs own indicators. The questionnaire is provided in Appendix 1 and each question also shows which indicator it is attempting to align with. The questionnaire also more broadly aligns with the Marine Protected Areas Management Effectiveness Initiative set up by the World Conservation Union's World Commission on Protected Areas (Marine) and the World Wide Fund for Nature, which has developed 16 indicators related to the socio-economic dimensions of marine protected areas.

Accompanying the household questionnaires were a series of key informant interviews. These were conducted by PICRC staff with a total of eight people from Ngaraard State. These interviews were held with Ngaraard State Government officials, village chiefs, conservation officers, local fishermen, and leaders of Ngaraard traditional community groups. An interview schedule with a list of semi-structured questions was used to guide the interview to help clarify some of the questionnaire findings and also ascertain the views of these interviewees in relation to the success and challenges of the conservation areas. Their views have been integrated into the discussion section.

A sample size for the socio-economic household questionnaire was determined for each of the six sites based on their population size (at a household level), as well as the desired confidence interval (or, margin of error– set at 5%) and confidence level (95%). A sample size calculator (<http://www.surveysystem.com/sscalc.htm>) was used to calculate the sample size for each of the sites – the results of which are illustrated below in Table 1.

Table 1. Determining the sample size for the six study sites

State and Study Site	Number of households	Number of household questionnaires (based on the sample size calculator)	Total number of questionnaires actually collected
<i>Ngaraard</i>	111	86	88
Ngchesar	78	65	65
Ngiwal	78	65	64
Peleliu	146	106	106
Airai	650	242	242
Kayangel	27	27	25
Total	1,162	591 (51% of all households)	590

In total, the sample size was determined as 591 household questionnaires. For Ngaraard State, the focus of this report, 86 questionnaires were required and 88 were collected for the study in total.

The questionnaires were administered in each of the six sites by local data collectors who were trained on how to collect data ethically and systematically. The data were then inputted into the Statistical Package of the Social Sciences (v22.0), and analysed. The analysis, for the purposes of this report to show baseline data, included basic frequencies, percentages, means and sums.

Provided below is a summary of the various indicators that were used and integrated into the household questionnaire.

Micronesia Challenge Indicators:

- MC1: Perception of change in food availability
- MC2: Household participation in MC management planning or decision making
- MC4: Change in violations and illegal activities related to fishing, harvesting and use of natural resources
- MC8: Community awareness of MC
- MC9: Community support for MC

Palau Indicators:

- PI1: Household food availability and sources
- PI2: Household dependence on local food resources
- PI3: Level of harvesting from local resources and their conditions-fishers and farmers
- PI4: Household income, expenses and subsistence distribution by source
- PI5: Perception of quality and quantity of water

Kerradel Conservation Network Management Plan 2011-2016 Indicators:

- Goal 1: By 2021, the laws, regulations, and plans that govern Ngaraard Conservation Areas are effectively implemented and enforced.
- Goal 3: Education and awareness programs promoting the value of conservation areas to the people of Ngaraard are developed.
- Goal 3 Objective 2: By December 2016, 50% of community survey respondents support the conservation area.
- Goal 4 Objective 5: By 2016, reports and survey results show a 50% decline in illegal harvesting from the conservation area.

- Goal 5: The development of eco-friendly programs for Ngaraard's conservation areas benefits the people of Ngaraard state and enhances Palau's tourism industry.
- Goal 5 Objective 1: By March 2012, the established nature trail at Ngerchokl will be made available for guided tours.
- Goal 5 Objective 2: By December 2016, 2 trails or tours have been established for guided tours.
- Goal 5 Objective 3: By December 2016, areas for camping and hiking have been identified and promoted and are generating income.
- Goal 5 Objective 4: By December 2016, medicinal and endemic plants have been identified and incorporated into tours.

Study Site

The state of Ngaraard is situated on the northern part of Babeldaob and is home to numerous watersheds, surrounding mangrove areas and coral reefs. Ngaraard has 5 main hamlets: Choll, Elab, Ngkeklau, Ngebuked, and Ulimang. It has a total population of 581 individuals (Palau Census, 2005) and a household population of 111 households.

The Kerradel Conservation Network is Ngaraard state's PAN sites which comprise of four legislated conservation areas: West Coast Mangrove Conservation Area, Ungellel Conservation Area, Ngerkall Lake and Metmellasech watershed Conservation Area and Diong Era Ngerchokl Conservation Area (Kerradel Management Plan 2011-2016). Each conservation area has no-impact zones (no entry, no take), as well as extractive use zones which allow for sustainable harvesting (Kerradel Management Plan 2011-2016). These conservation areas were established to enable the citizens of Ngaraard to sustainably manage their resources as well as to continue to enjoy their marine and terrestrial resources (Figure 1).



Figure 1. The marine and terrestrial conservation areas that comprise the Kerradel Conservation Network (Ngaraard Mangrove Conservation area, Ungellel Conservation area, Ngerkall Lake and Metmellasech Watershed Conservation area and Diong era Ngerchokl conservation area). Source: Kerradel Management Plan 2011-2016.

Results

Socio-demographics

Most respondents were male (58%) with 42% female respondents. The mean age of respondents was 54.6, with a range of 25 to 87 years. In terms of the length of time lived in this state, 97.7% of respondents mostly lived in Ngaraard all their lives, with 2.3% having lived in Ngaraard for less than a year. In terms of marital status, most respondents were married (46.6%), followed by being single (40.9%) or widowed (9.1%) and divorced (3.4%). The vast majority (or all) of respondents held Palauan citizenship (98.9%). Table 2 provides some further socio-demographic characteristics of the respondents and their households.

Table 2. Socio-demographic information on respondents and their household

Education (%)		Traditional knowledge (%)		Income (%)		Land tenure (%)		Participate in resource management (%)	
Up to elementary school	10	None	0	Government work	28	Traditional agreement	1.1	Never	41
Up to high school	47	Some	45	Pension/ social security	31	Owens land	97	Seldom	31
Up to college	39	Extensive	54	Fishing (fish, invertebrates)	15	Leases from State Government	0	Always	1.1
Up to university	2.3			No income	5	Private rental	4.5	Sometimes	24
				Other	0	Informal agreement	3	Often	3.4
				Private business	2				
				Farmer	17				

As shown in Table 2, 47% of respondents reported having obtained formal education up to high school and had indicated an extensive level of traditional knowledge. In

terms of respondents' level of participation in the decision making process towards Ngaraard's conservation areas, 41% of all respondents have never participated in resource management planning and decision making and 31% indicated that they seldom or never (41%) participated in such activities.

Households ranged in size from 1 to 10, with a mean of 3.5 people. Figure 2 shows the total number of people in each age group living in each surveyed household, and Figure 3 shows the average size of each household.

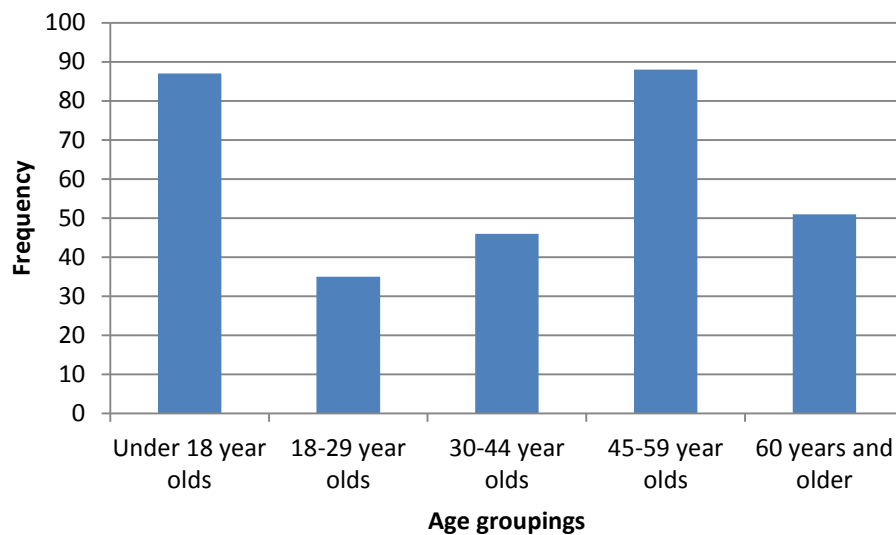


Figure 2. Number of people in each age group living in the surveyed households

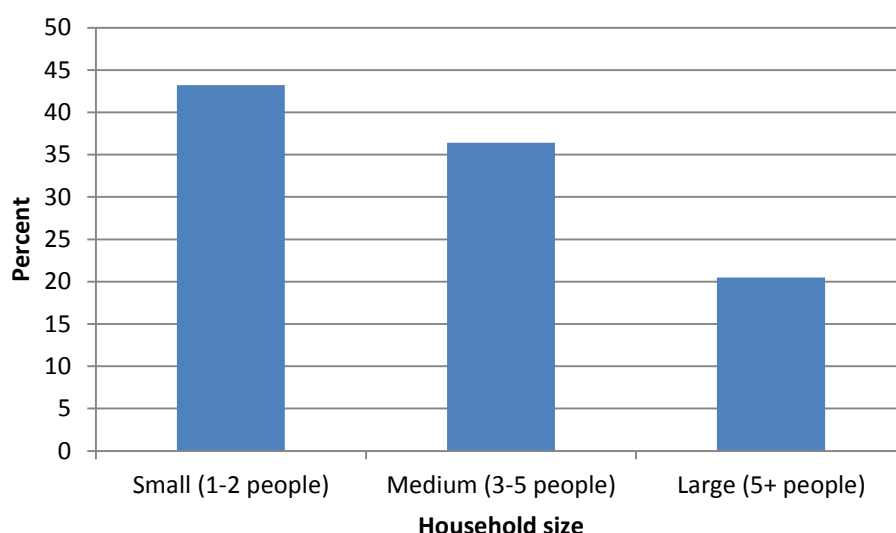


Figure 3. The average size of each surveyed household.

Income and Livelihood activities

The questionnaire sought to identify the key income and subsistent livelihood activities of each surveyed household. Most respondents reported an annual household income of less than \$500, with the second income level of between \$500-\$1,000 and fewer households reporting an income of more than \$1,500 (Figure 4). In relation to the protected areas, almost all respondents indicated no changes to their household income or expenditures as result of the protected areas (Table 3).

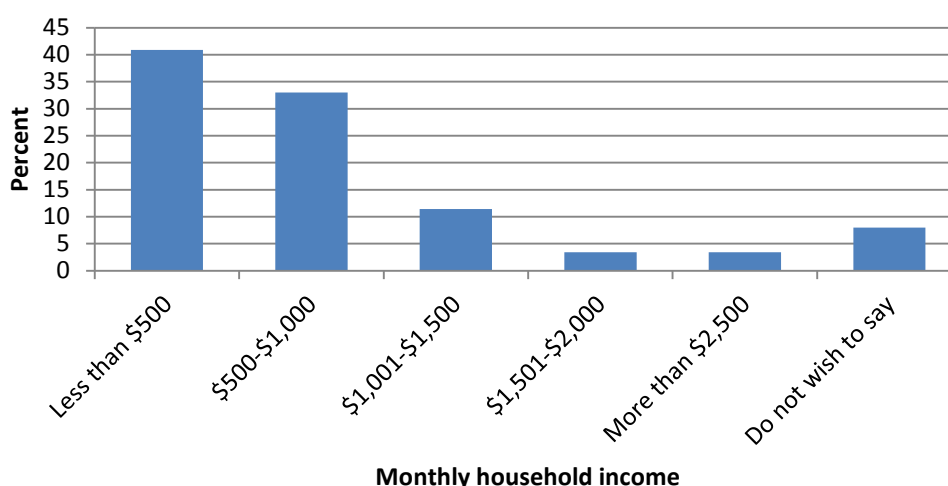


Figure 4. Monthly household income according to respondents.

Table 3. The reported effect of the conservation areas on household income and expenses (**bold** denotes highest percent in each food category).

	Greatly increased	Somewhat increased	Not Changed	Somewhat decreased	Greatly decreased	Don't know
Household income	0%	3.4%	93.2%	0%	0%	3.4%
Household expenses	0%	5.7%	90.9%	0%	0%	3.4%

Respondents also reported on their household's key subsistence livelihood activities which included fishing, harvesting invertebrates, farming crops and rearing livestock. Of the surveyed households, 67% reported that at least one member of their household participated in fishing and harvesting invertebrates. 48% of households mostly participated in fishing activities for food consumption and less for income (12.5%) (Figure 5). In addition, most households indicated that they harvested invertebrates mainly for food consumption (35%) (Figure 5). The majority of all surveyed households in Ngaraard participated in fishing fish and harvesting invertebrates on a weekly and/or monthly basis.

In terms of farming crops, 82% of households reported participating in farming activities (Figure 5) with very minimal use of pesticides. Most respondents indicated farming crops for food consumption only (44.3%) and 9% of households reported generating an income from farming activities. 90% of respondents did not participate in livestock activities, while less than 6% of households rear livestock for either income or food consumption (Figure 5).

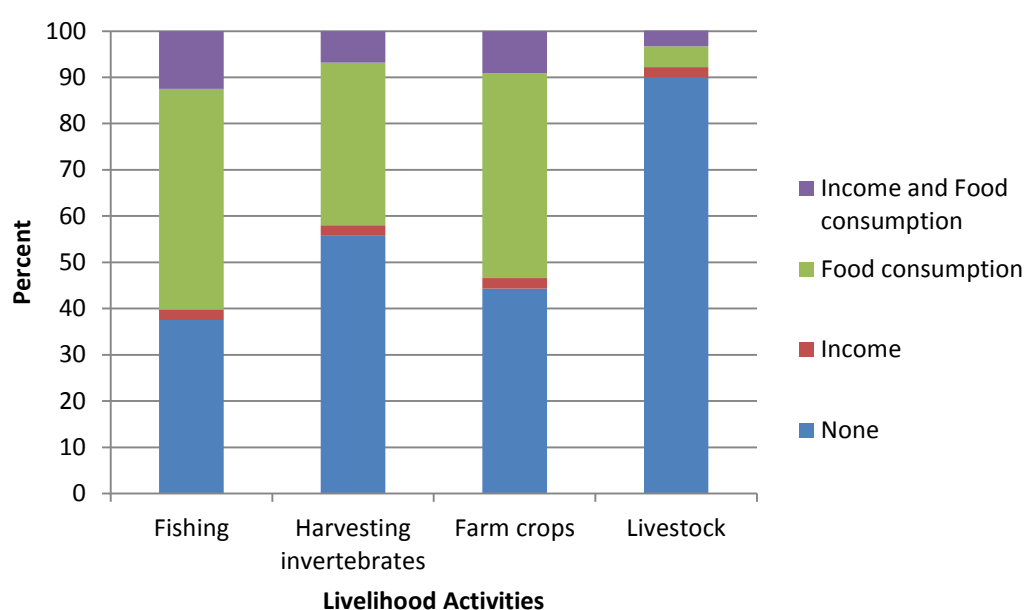


Figure 5. Household level of resource use for livelihood activities in Ngaraard State.

For those surveyed households that utilised farm crops for their livelihoods, the main land area size noted was less than 0.25 acre. In terms of livestock, those that utilised livestock as part of the suite of livelihood activities mainly had 1-5 livestock (9.1%), followed by 6-10 livestock (1.1%).

Most surveyed households reported that on average, 40% of their fish catch was for food consumption while 6.4% was for income generating activities, followed by giving

away (9%), and for family customs (8.18%) (Figure 6). In terms of harvesting invertebrates, households indicated that on average 23% of their invertebrate harvest was for food consumption, with a smaller percentage for selling (7%), giving away (10%) and family customs (6.5%) (Figure 6). Similarly, households reported that most of their household grown crops were mainly for food consumption (33%), with less for selling (11%), giving away (9%) and family customs (8.6%) (Figure 6).

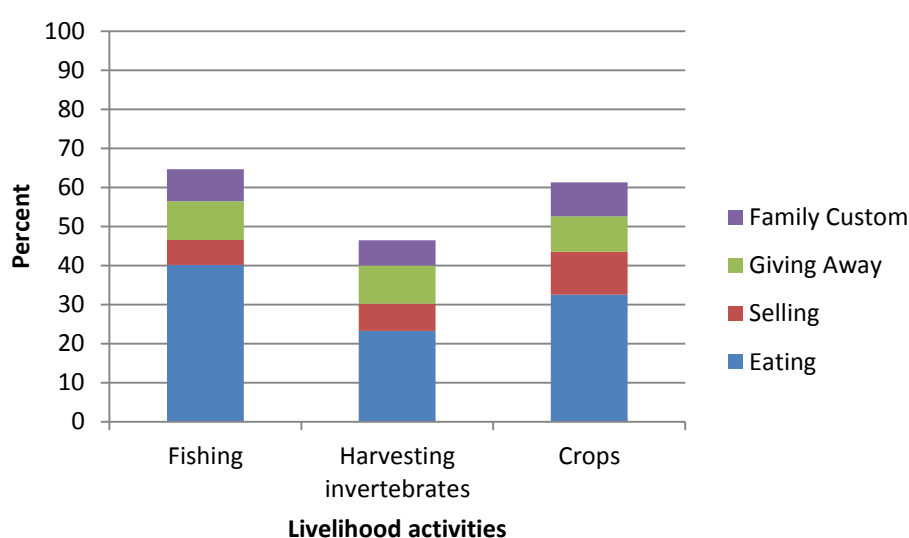


Figure 6. Household resource use for various livelihood activities in Ngaraard state.

Of the households that participated in fishing and invertebrate harvesting activities, 41% fish by handline and spear diving (41%), followed by gleaning (32%) or harvesting invertebrates and cast net (32%) (Figure 7). Figure 7 further summarizes all key methods used as a means for fishing fish or harvesting invertebrates.

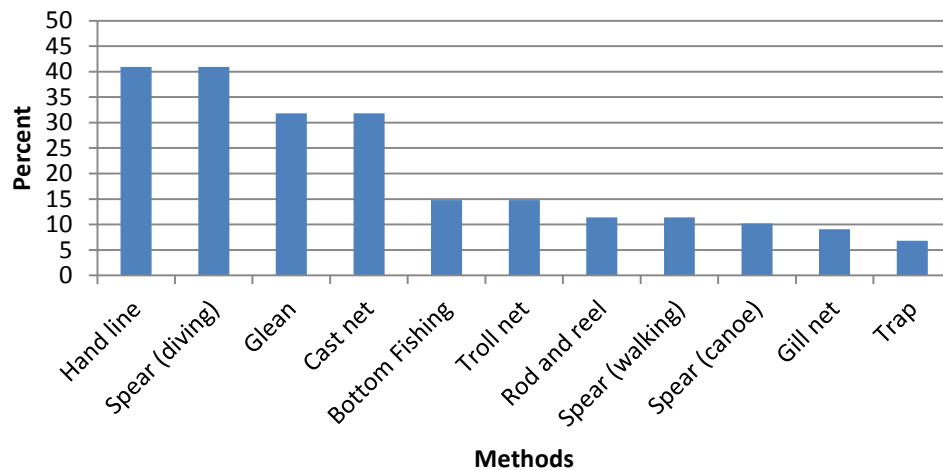


Figure 7. Methods used by households for fishing related activities.

Majority of households reported that the top two threats to Ngaraard's fisheries were overfishing and climate change. As a solution for these threats, respondents recommended stricter laws and stronger enforcement of such laws.

Food and Water Security

Respondents were asked where their household's food supply came from, how often it was sourced and if this was different compared to five years ago. The results of this are in Table 4.

Over half of respondents reported that their household relies moderately on household grown crops and/or vegetables and this was the same compared to five years ago (Table 4). Households also relied very little (46.6%) on local market marine resources but rely heavily on imported processed or canned foods (44.3%) (Table 4). Almost all household food sources were not different compared to five years ago.

Table 4. Household's food supply in comparison to five years ago (**bold** denotes highest percent in each food category).

	Now - how often (%)				Compared to five years ago (%)		
	<i>A lot</i>	<i>Moderate</i>	<i>Little</i>	<i>None</i>	<i>More</i>	<i>Same</i>	<i>Less</i>
Household grown crops and/or vegetables	8.0	55.7	17.0	19.3	30.7	51.1	18.2
Local market crops and/or vegetables	3.4	38.6	30.7	27.3	25.0	53.4	21.6
Imported crops and/or vegetables	11.4	25.0	38.6	25.0	19.3	61.4	19.3
Self-caught marine resources	28.4	38.6	15.9	17.0	29.5	53.4	17.0
Local market marine resources	6.8	13.6	46.6	33.0	25.0	51.1	23.9
Imported marine resources	1.1	3.4	27.3	68.2	18.2	55.7	26.1
Local freshwater resources	44.3	43.2	5.7	6.8	17.0	72.7	10.2
Local land animals (pigs, birds, fruit bats)	4.5	30.7	27.3	37.5	10.3	70.1	19.5
Locally produced livestock	0	5.7	11.4	83.0	4.6	64.4	31.0
Imported livestock (meat)	4.5	27.3	17.0	51.1	13.8	65.5	20.7
Imported processed or canned foods from shop	44.3	36.4	11.4	8.0	31.8	52.3	15.9
Other	0	0	0	0	0	0	0

More than half of respondents (82%) indicated that they or members of their households grow farm crops. Of the households that indicated growing farm crops, 62% grow taro, followed by fruit trees (48%), betel nut (48%), coconut (40%), tapioca (35%), sweet potatoes (34%) and garden vegetables (26%) (Figure 8). Respondents who participated in farming activities mainly used animal manure and green manure or compost for fertilizing their farm crops (Figure 9). In terms of pesticide use (including insecticides, herbicides and fungicides), respondents showed a very limited use (4.8%) on household crops.

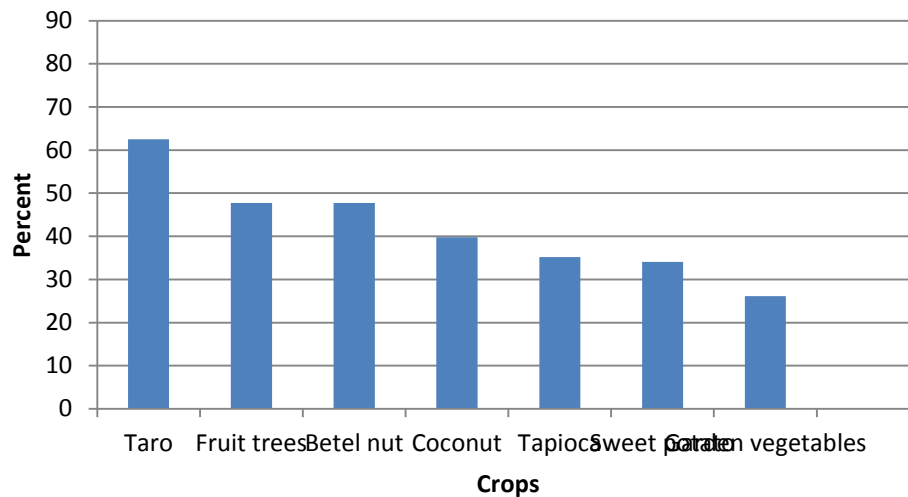


Figure 8. Crops grown by households in Ngaraard state.

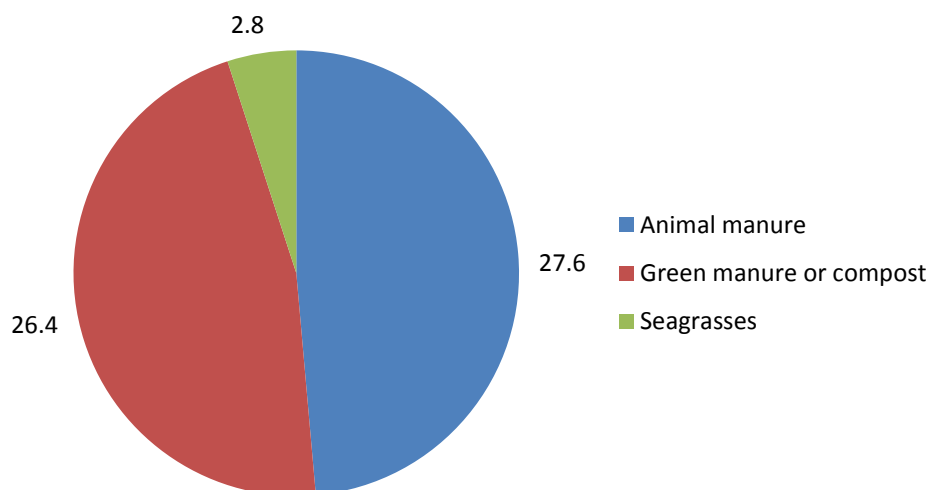


Figure 9. Main fertilizers used on household grown crops.

Respondents were also queried regarding their perceptions on the quality of their household drinking water and general use water. More than half of respondents (53%) relied on household rainwater tanks, village wells or taps (41%), and village rainwater tanks (36%) for sources of household water (Figure 10). 60% of respondents reported that they had access to safe drinking water while 32% stated not having safe drinking water (Figure 11). 82% of respondents reported having safe

general use water for their household with 17% indicated not having access to safe household water (Figure 11).

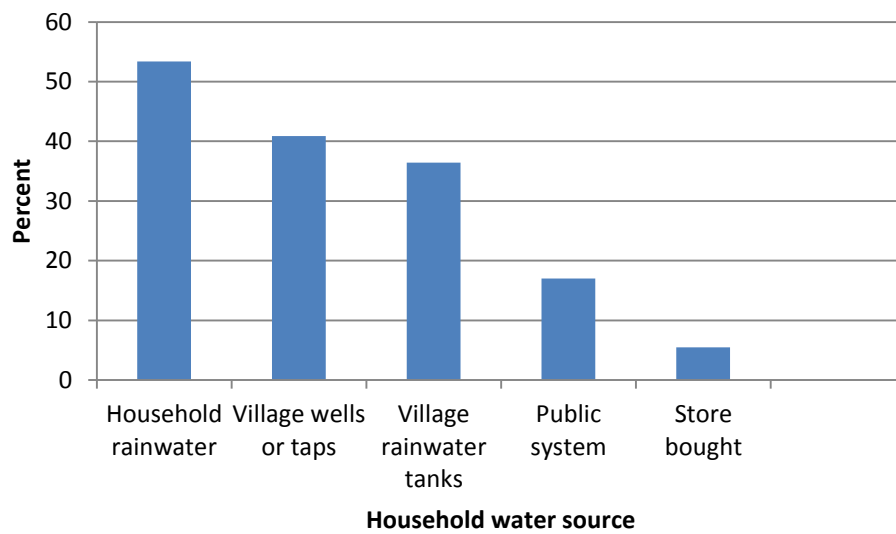


Figure 10. Sources of household water in Ngaraard state.

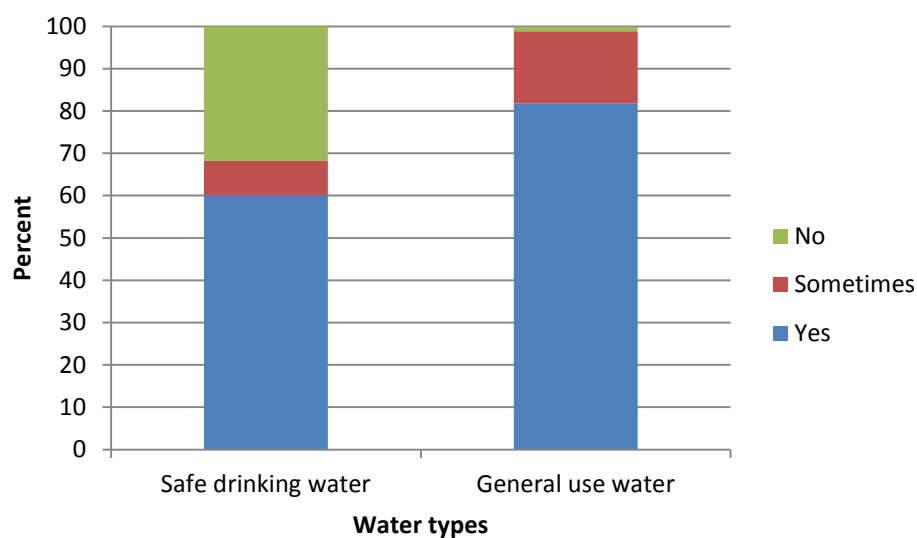


Figure 11. Household access to safe drinking water and general use water.

Views on the Conservation Areas

With the overall focus of this study, it was crucial to identify if respondents had heard of different conservation initiatives such as the MC, PAN, state bul and state

conservation areas. More than 80% of respondents had heard of and were knowledgeable of the PAN, state bul and state conservation areas, however 47% of respondents indicated that they had never heard of the MC (Figure 12). Similarly, most respondents had medium to extensive level of knowledge regarding the PAN, state bul and state conservation areas, with more respondents having no knowledge of the MC (Figure 13). In terms of level of support for the different conservation initiatives, most respondents were supportive of the PAN, state bul and state conservation areas (Figure 14). As shown in figure 14, more than half of respondents had limited or no support for MC as they also had no knowledge of the initiative.

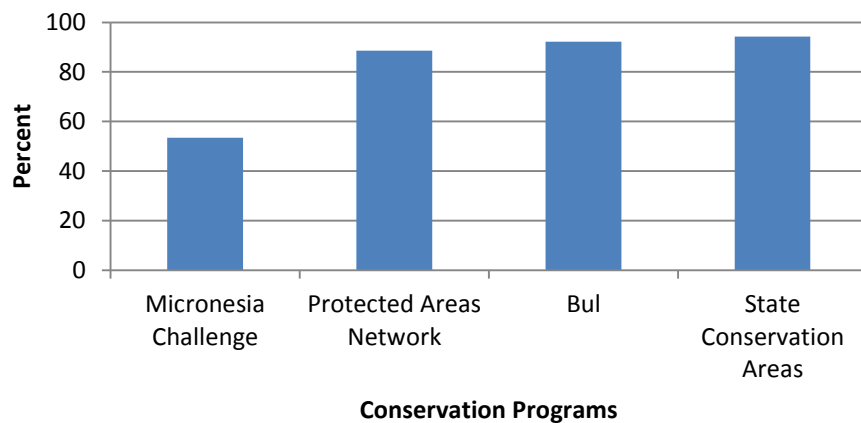


Figure 12. Level of awareness of different conservation initiatives.

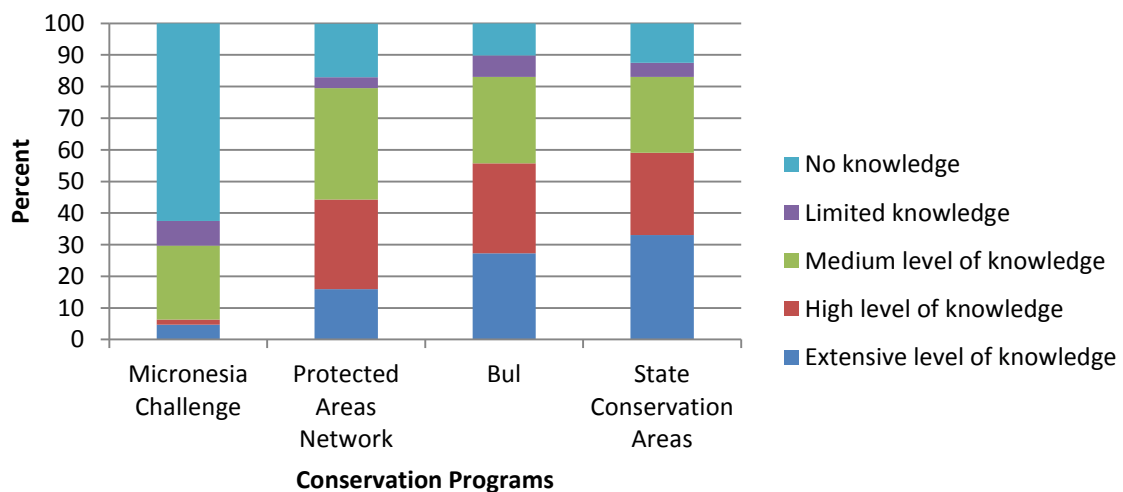


Figure 133. Level of knowledge of different conservation initiatives.

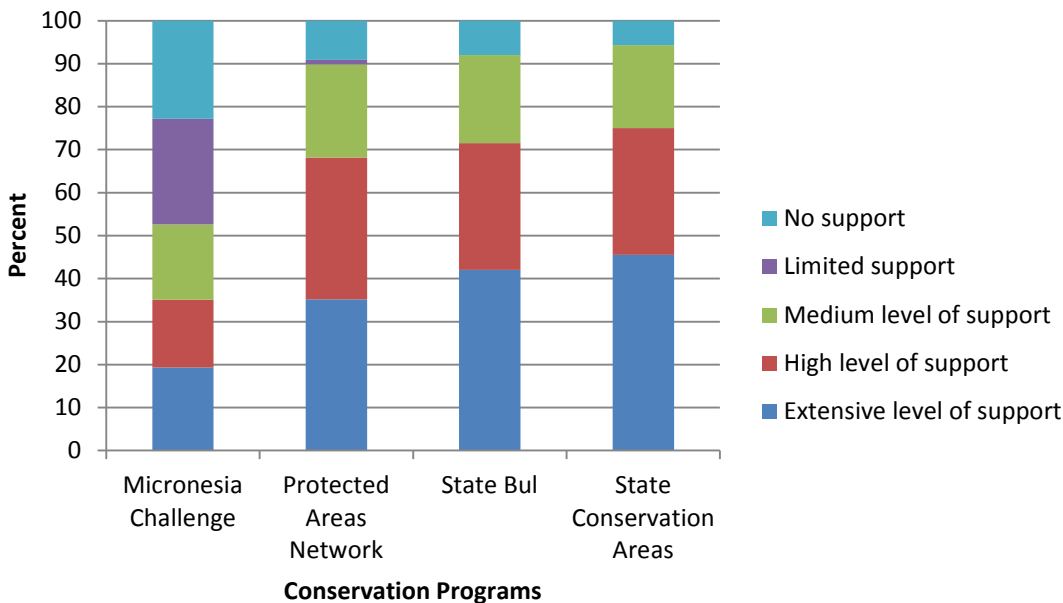


Figure 14. Level of support for different conservation initiatives.

36.4% of respondents reported that they had no knowledge of any of the allowable activities regarding the conservation areas within the Kerradel Conservation Network (Figure 15). 48.9% of respondents indicated having some knowledge and 14.8% reported having knowledge of all allowable activities of the conservation areas (Figure 15). 60.2% of all respondents reported that they or members of their household had seen, read and/or participated in any outreach activities related to the conservation areas (Figure 16).

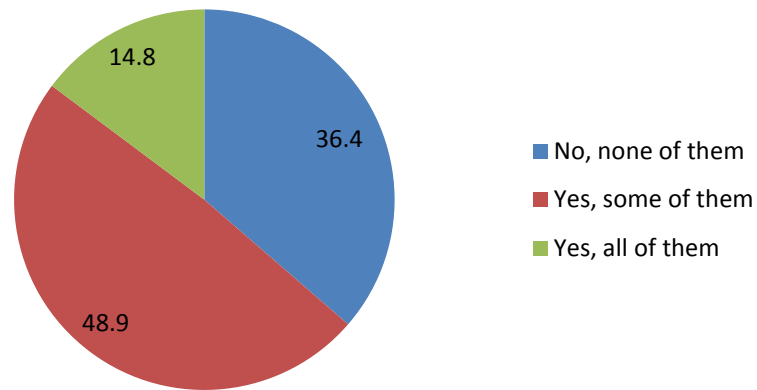


Figure 15. Respondents' knowledge of allowable activities or regulations of the conservation areas within Kerradel Conservation Network.

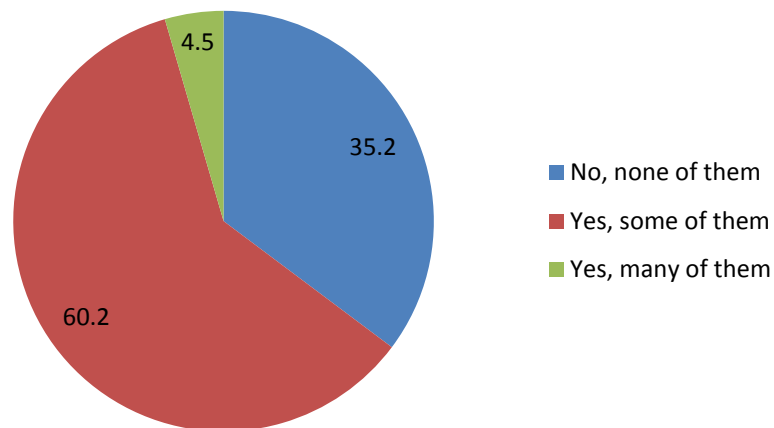


Figure 16. Involvement with activities related to the conservation areas within Kerradel Conservation Network.

The main sources of outreach materials witnessed by respondents were awareness print materials and factsheets. Slightly over 25% of respondents had participated in education and/or awareness plans and less for student field education programs (Figure 17).

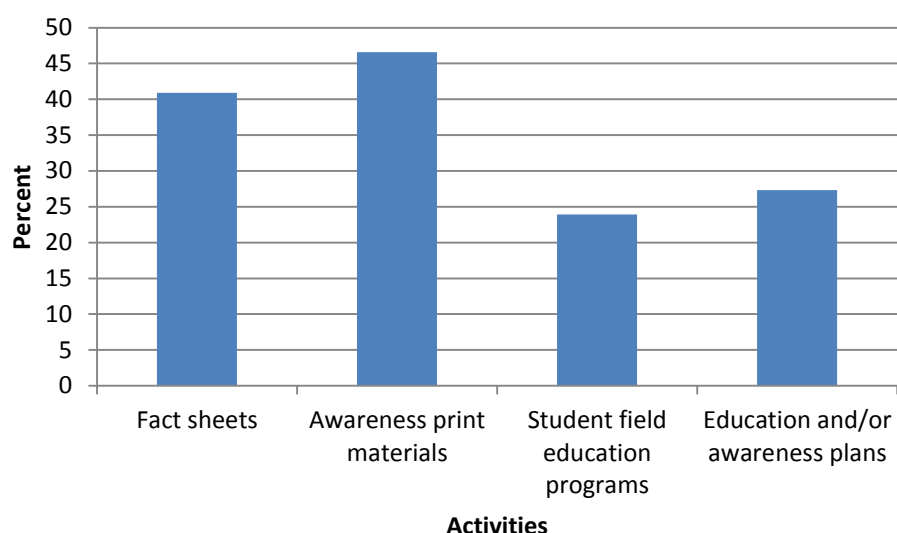


Figure 17. Activities that respondent and their household members have participated in.

Most respondents did not attribute any changes to locally-sourced marine and terrestrial food availability to the protected areas (Tables 5 and 6). This was similar to changes to the overall quality of the marine environment as well as the overall quality of the terrestrial environment (Tables 5 and 6).

Table 5. The perceived impact of the Marine Protected Areas on livelihood factors (**bold** denotes highest percent for each variable listed in the first column).

	Greatly increased	Somewhat increased	Not changed	Somewhat decreased	Greatly decreased	Don't know
Overall quality of the marine environment	27.3	10.2	44.3	4.5	1.1	12.5
Abundance of fish	29.5	4.5	48.9	3.4	1.1	12.5
Abundance of invertebrates	26.1	9.1	47.7	2.3	2.3	12.5
Size of fish	27.3	8	50	1.1	1.1	12.5
Size of invertebrates	27.3	6.8	50	2.3	1.1	12.5
Availability of food from fish	26.1	8	48.9	2.3	2.3	12.5
Availability of food from invertebrates	27.3	8	48.9	2.3	2.3	11.4
Spiritual and cultural amenity	27.3	5.7	50	1.1	1.1	14.8

Table 6. The perceived impact of the Terrestrial Protected Areas on livelihood factors (**bold** denotes highest percentage for each variable listed in the first column).

	Greatly increased	Somewhat increased	Not changed	Somewhat decreased	Greatly decreased	Don't know
Overall quality of the terrestrial environment	25	17	46.6	1.1	1.1	9.1
Abundance of fruit bats	21.6	15.9	44.3	3.4	1.1	13.6
Abundance of medicinal plants	20.5	18.2	44.3	2.3	1.1	13.6
Abundance of building materials	22.7	13.6	44.3	3.4	2.3	13.6
Size of fruits bats	25	12.5	44.3	1.1	1.1	14.8
Size of building materials	28.4	9.1	44.3	1.1	2.3	13.6
Availability of farm food (crops)	25	17	43.2	2.3	1.1	11.4
Quality of public freshwater	14.9	25.3	44.8	2.3	1.1	11.5
Quantity of public freshwater	19.3	20.5	46.6	0	2.3	11.4
Spiritual and cultural amenity	25	15.9	43.2	2.3	2.3	11.4

Finally, respondents were asked to reflect on a series of statements related to the overall impact and progress of the Conservation Areas in improving livelihood outcomes. These attitudinal statements were placed on a scale of 0 (do not agree) to 4 (very strongly agree). Respondents could also select 'don't know'. The results (both means and percentages) and illustrated below in Table 7.

Table 7. Attitudinal statements related to the Conservation Areas (**bold** denotes highest percent for each variable listed in the first column).

Statements	Mean Value	Very strongly agree	Strongly agree	Moderately agree	Agree a little	Do not agree	Don't know
Overall, the Conservation Area(s) has been beneficial to our community	6.33	42.0	35.2	11.4	8	0	3.4
I often see or hear about illegal entry or taking of resources from the Conservation Area(s)	27.42	30.7	20.5	10.2	8	4.5	26.1
There is adequate enforcement of the rules of the Conservation Area(s)	6.08	39.8	27.3	14.8	11.4	3.4	3.4
There is adequate monitoring of the natural resources in our community	8.07	33.0	29.5	13.6	12.5	5.7	5.7
There have been positive livelihood benefits due to the Conservation Area(s)	8.50	47.7	27.3	10.2	8	1.1	5.7
There have been positive economic benefits due to the Conservation Area(s)	7.32	42.0	31.8	10.2	9.1	2.3	4.5
There have been positive cultural and spiritual benefits due to the Conservation Area(s)	8.34	43.2	26.1	13.6	6.8	4.5	5.7
There have been positive environmental benefits due to the Conservation Area(s)	7.40	48.9	26.1	10.2	6.8	3.4	4.5
Everyone benefits equally from the Conservation Area(s)	8.43	46.6	26.1	11.4	6.8	3.4	5.7
If we want to preserve our	7.52	51.1	28.4	9.1	5.7	1.1	4.5

natural resources then 'closing off' certain areas is necessary							
-----------------------------------------------------------------	--	--	--	--	--	--	--

Local Management Plan

More than half of respondents (58%) were aware and knowledgeable of the West Coast Mangrove Conservation Area, however only 40% of respondents were aware of its boundaries (Figure 18). Similarly, majority of respondents were aware of the Ungelley Conservation Area (68%), Ngerkall Lake and Metmellasech watershed Conservation Area (76%), and Diong Era Ngerchokl Conservation Area (82%) however, just slightly over half of respondents were knowledgeable of the boundaries of all conservation areas within the Kerradel Conservation Network (Figure 18).

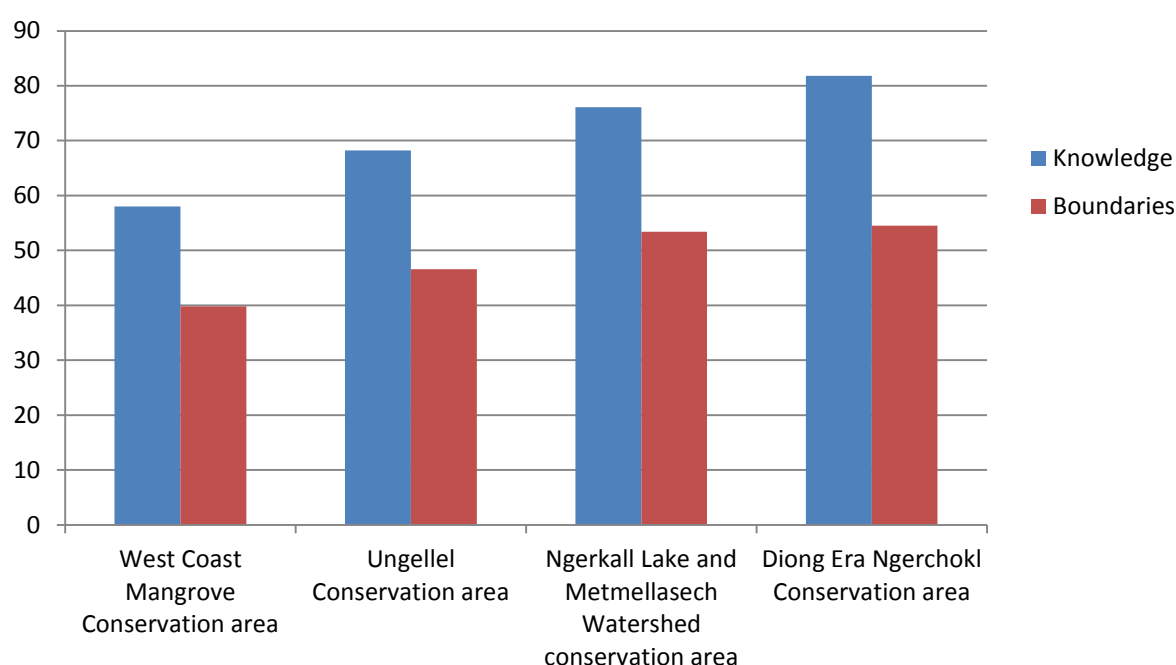


Figure 18. Respondents' knowledge of the local Conservation Areas and associated boundaries.

Discussion

Respondents were mostly Palauan citizens. The majority of which were male who have lived in Ngaraard all their lives. Of the respondents, more than half obtained formal education up to high school and have indicated a level of traditional knowledge. Majority of all respondents have never participated in resource management decision making and planning.

Most respondents did not attribute any changes to their household income or expenses due to the protected areas. Majority of household respondents indicated that they or members of their household participated in fishing and farming related activities mainly for food consumption purposes and customary practices. Only a small percentage of households participated in fishing and farming activities for income generating activities. More households rely heavily on imported food and crops compared to five years ago and have less dependence on locally sourced marine and terrestrial food.

In terms of respondents' views of the conservation areas, most household respondents were aware and knowledgeable of the PAN, state bu and state conservation areas and less for the MC. This was similar in terms of respondents' level of support for the different conservation initiatives. Although a majority of the respondents had knowledge of all conservation areas within the Kerradel Conservation Network, only half of respondents were knowledgeable of the boundaries of the conservation areas.

During key informant interviews, most interviewees argued that there is a lack of education and awareness activities/programs regarding the purpose, rules, regulations and boundaries of the conservation areas and this may lead to a lack of respect towards conservation areas in Ngaraard State. Confirming this, most household respondents and key informants cited that there was a lack of enforcement and awareness programs for the Kerradel Conservation Areas. Based on key informant interviews, one of the reasons why illegal entry and poaching still occurs in some of the conservation areas is due to a lack of alternative sources of livelihoods. "People need to continue to sustain their livelihoods and income, and there is not enough alternative sources of livelihoods for residents in Ngaraard" as stated by one Key Informant. Most key informants strongly believe that Kerradel Conservation Network can have more successful outcomes for the people of Ngaraard; however, there needs to be stronger enforcement along with more funding, personnel, equipment, and training (i.e. biological monitoring and surveillance) in order to improve the management of the Kerradel Conservation Network.

Conclusion

This study provides useful socio-economic information regarding the Kerradel Conservation Network and also serves as baseline socio-economic data for the Kerradel Conservation Network. These results illustrate the trends that currently take place within Ngaraard State and can also be used to make a preliminary assessment on the effectiveness of PAN sites in improving livelihood outcomes. In the long term, continuous socio-economic monitoring is necessary to document changes and

trends so that site managers and relevant stakeholders will be able to adaptively manage the conservation areas in Ngaraard State.

Acknowledgements

We wish to acknowledge and thank the Ngaraard state Government, Ngaraard State PAN office and the people of Ngaraard as well as the data collectors, Eileen Ngirturong, Cassandra Mitlab and Justice Blailes for their assistance and support throughout this study. We would also like to thank the Palau Socio-economic working group, Dr. Supin Wongbusarakum, and King Sam for their feedback and assistance with the questionnaires and performance rubric for this project. Lastly we would like to thank PICRC researchers, research assistants and numerous interns for assistance with data entry and analysis for this project. Funding for this study was made possible through funding from the GEF Small Grants Program, NOAA Coral Reef Conservation Program and the Micronesia Conservation Trust.

References

Bartlett, C.Y., Pakoa, K. and Manua, C. (2009) 'Marine reserve phenomenon in the Pacific Islands', *Marine Policy*, 33, 673-678.

Cinner, J.E. and Aswani, S. (2007) 'Integrating customary management into marine conservation', *Biological Conservation*, 140: 201-216.

Kerradel Conservation Network Management Plan 2011-2016.

Johannes, R.E. (1978) 'Traditional marine conservation methods in Oceania and their demise', *Annual Review of Ecology and Systematics*, 9: 349-364.

Johannes, R.E. (2002) 'The renaissance of community-based marine resource management in Oceania', *Annual Review of Ecological Systems*, 33: 317-340.

Mora, C., Andrefouet, S., Costello, M.J., Kranenburg, C., Rollo, A., Veron, J., et al. (2006) 'Ecology: Enhanced coral reefs and the global network of marine protected areas', *Science*, 312: 1750-1751.

Veitayaki, J. (1997) 'Traditional marine resource management practices used in the Pacific Islands: An agenda for change', *Ocean and Coastal Management*, 37: 123-136.

Project Title: Socio-economic Study of Palau's Protected Areas Network**PARTICIPANT INFORMATION SHEET FOR SURVEY PARTICIPANTS**

I, Karen McNamara, kindly seek your assistance with a research project exploring the effectiveness of the Protected Areas Network on livelihood outcomes across six sites in Palau. This research project is being conducted by The University of Queensland in close partnership with the Palau International Coral Reef Center (based in Koror). This research seeks to draw on the views and experiences of locals to better understand the overall livelihood benefits, or not, of the protected areas network.

This research will involve the collection of information about your household socio-demographics, livelihood activities and income, food and water security, and views on the conservation areas. The results from which will be written up in reports and peer-reviewed literature to illustrate progress towards the socio-economic outcomes of the Protected Areas Network.

Your participation is voluntary. At all stages of the research, participant feedback is warmly welcomed. If you would like more information on this research project, please don't hesitate to contact me.

This study adheres to the Guidelines of the ethical review process of The University of Queensland and the National Statement on Ethical Conduct in Human Research. Whilst you are free to discuss your participation in this study with project staff (contactable on +61 (7) 3365 6069 or karen.mcnamara@uq.edu.au), if you would like to speak to an officer of the University not involved in the study, you may contact the Ethics Coordinator on +61 (7) 3365 3924.

I would like to thank you very much in participating in this research.

Dr Karen McNamara

Lecturer

School of Geography, Planning and Environmental Management

The University of Queensland

E: karen.mcnamara@uq.edu.au

HOUSEHOLD QUESTIONNAIRE: PALAU INTERNATIONAL CORAL REEF CENTER

Surveyed by: _____ Date: _____ Survey No: _____

State: _____ Hamlet: _____

SECTION ONE: Socio-demographics. Telengtengil a delengchokl

1. Obtain the following information for the ‘interviewee’ - who is the ‘head of household’ (remember to aim for a gender balance, where possible).
(PICRC1, MC2)

A. Who Ng techa oungerachel er a delengchokl?	B. Age (in years) Ng tela rekim?	C. Have you always lived in this State? Ke meketeketang el kiei er tia el beluu?	D. Marital Status Ke bechiil?	E. Highest level of formal education Kot el ngar bab el skuul el mtilobed er ngii	F. Highest level of practice of traditional knowledge Klemdengei er a siukang, klebelau me a klechibelau	G. How do you predominately earn an income? Uchul a klekerngem	H. Citizenship Chad er ker	I. Does your family own the land you live on? Tia el om kiei er ngii ng chetemem	J. Participate in resource management planning and decision making Mla nga er a omesodel me a omelchesel a llechul me a omengermelel a ngikel, cheled, blul el basio.
(Interviewee)									
1=‘Male’ head of household 2=‘Female head of household’		0 =Yes 1 =No, less than 1 year 2 =No, between 1-5 years 3 =No, more than 5 years	1=Single 2=Married 3=Widow 4=Divorced 5=Other (specify)	1=Up to elementary 2=Up to high school 3=Up to college or similar 4=Up to university or similar 5=None 6=Other (specify)	1=Extensive Dmolech el klemdengei 2=Some Medengei a bebil 3=None Diak	1=No income 2=Handicraft 3=Fishing (catch and/or harvest) 4=Farmer (crops, livestock) 5=Private business 6=Remittances 7=Land or house lease 8=Government work 9=Family custom 10=Pension/social security 11=Other (specify)	1=Palau 2=Other (specify)	1=Yes 2=No, lease from State Gov’t 3=No, private rental 4=No, informal agreement 5=No, traditional arrangement	0= Never Diak 1= Seldom Derstang 2= Sometimes Bebil ra taem 3= Often Oumesind ra taem 4= Always Bek el taem

2. Indicate how many people (adults and children), including yourself, live in your household, including their age group: **Te tela el chad el uldimukl er kau a kiei er a delengcheklem e dertela rekrir?** (PICRC1, MC2)

	Under 18 years old	18-29 years old	30-44 years old	45-59 years old	60 years old and higher
Number					

SECTION TWO: Livelihood Activities and Income. Omenged, Omelngot me a Omengerker

3. What income and subsistent livelihood activities does your household do? **Ngera el omenged me a omelngot a omoruul er a delengcheklem?** (PI1, PI3, PI4)

E.g.: Do you or anyone else in your household go out to catch or harvest? **If No, select 'None'. If Yes, is this for money or food or both (select all that apply).** And how often (on average over a year) ? **Ng ngar ngii a ngar er a delengcheklem el oumenged el melngot el di kall, ng makit a lechub e ngii el teblong? E a le ngar er ngii e ng locha tela el taem er a ta el rak?**

Complete this for all the other livelihood activities (harvest, farm crops and livestock).

Catch (fish, turtles etc)			Harvest (invertebrates)			Farm crops			Livestock		
<input type="checkbox"/> None			<input type="checkbox"/> None			<input type="checkbox"/> None			<input type="checkbox"/> None		
For \$	For food	How often (on av./yr)	For \$	For food	How often (on av./yr)	For \$	For food	Area (acres)	For \$	For food	How many (on av./yr)
<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>	_____
		1=daily 2=weekly 3=monthly 4=6 months+			1=daily 2=weekly 3=monthly 4=6 months+			1=<0.25 2=0.25-1 3=>1			1=1-5 2=6-10 3=>10

4. What is the monthly income level of your household? **Ng locha telang a uldekial a kerrekerngem me a rebek el mengerker el kiei er a delengcheklem er a chelsel a ta el buil?** (PI4)

Less than 500\$ Mekesai er a 500	500-1,000\$	1,001-1,500\$	1,501-2,000\$	2,001-2,500\$	More than 2,500\$ Betok er a 2,500	Do not wish to say Diak el soal el ouchais
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Have the Conservation Area(s) changed your household income or household expenses? **A ika el blul el basio, ng ngar er ngii a blal ngedechii er a klungel a kerrekerngem me a omengitem er a udoud?** (PI4)
- If No, mark ‘not changed’ box
 - If Yes, has it increased or decreased your household income/expenses? Greatly/Somewhat?

	Greatly Increased Kmal klou	Somewhat Increased Ngar er ngii	Not Changed Diak a mla mengodech	Somewhat Decreased Mla ngmanget	Greatly Decreased Kmal mla ngmanget	Don't Know Ng ngaukai
Household <u>income</u> . <u>Kerrekerngel a delengchokl</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Household <u>expenses</u> . <u>Omengitel a udoud er a delengchokl</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION THREE: Food and Water Security. Ulekerreuil a Kall me a Ralm

6. Indicate where your household's food supply comes from, how often it is sourced, and if this is different compared to five years ago: **Ka mouchais el kmo a kall er a delengcheklem ng ngar ker el mei, e merames ng mekudem a ngeiul/skel , e ngodech a lechub e ng di osisiu me a eim el rak er a mla me mong?** (PI2)

	Now - how often chelechang el taem - kudem				Compared to five years ago Eim el rak er a mla me mong		
	<i>A lot</i> Mekudem	<i>Moderate</i> Klebech	<i>Little</i> Merames	<i>None</i> Diak	<i>More</i> Betok	<i>Same</i> Osisiu	<i>Less</i> Mekesai
Household grown crops and/or vegetables Sers er a ongraol me a yasai	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local market crops and/or vegetables Ongraol me a yasai er a makit (delomel er Belau)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Imported crops and/or vegetables Ongraol me a yasai el ngar er a ikrel Belau el mei	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Self-caught marine resources Oumenged	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local market marine resources Ngikel me a cheled er a makit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Imported marine resources Ngikel me a cheled el ngar er a ikrel Belau el mei	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local freshwater resources Usbechel a ralm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local land animals (pigs, birds, fruit bats) Odoim el charm er a beluu (babii, charm el suebek, olik)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Locally produced livestock Kerbou, kaming me a babii er a sers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Imported livestock (meat) Tech er a kerbou, kaming el mla er a ikrel a Belau	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Imported processed or canned foods from shop Kansume er a stouang	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other _____ Kuk bebil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The following questions are only applicable if the interviewee and/or members of their household go out to the ocean to catch or harvest (if not, move to the end of Question10)

<input type="checkbox"/>	Select this box if the following questions are <u>not applicable</u>
--------------------------	----------------------------------------------------------------------

7. Which methods do you and/or members of your household use to catch or harvest? Ng ngera el teletael er a omenged a om ngar er ngii, kau me a rebek el chad er a delengcheklem? (select all that apply) (PI3)

<input type="checkbox"/>	Glean Omelai el cheled	<input type="checkbox"/>	Spear (walking) Omurch (di merael)	<input type="checkbox"/>	Spear (diving) Melechelbaki
<input type="checkbox"/>	Spear (canoe) Oltoir (a uel) Melkelikes (omurch a chemang me a ngikel)	<input type="checkbox"/>	Hand line Mengereel Omedesaki	<input type="checkbox"/>	Rod and reel Mengereel obang a sao
<input type="checkbox"/>	Trap Omub (ngikel me a chemang)	<input type="checkbox"/>	Cast net Omuked	<input type="checkbox"/>	Gill net Mengesokes
<input type="checkbox"/>	Bottom fishing Mengereel er a dmolech	<input type="checkbox"/>	Trolling Mengetaki	<input type="checkbox"/>	Other _____

8. Over the past year, list up to three locations that you and/or members of your household most frequented for catch or harvest, and indicate if these sites are different to where you most frequented five years ago? Please try and keep these locations quite general and broad. **A chelsel tia el mlo merek el rak, e ngera a kldei el basio el kau me ar kiei er a delengcheklem a blechoel el mo er a chei er ngii. E a ika el basio ng ngodech a lechub ng osisiu er a basio el obla er a chei er ngii er a cheim el rak er a mla me mong?**(PI3)

Location	Compared to five years ago	
	Same <i>Osisiu</i>	Different <i>Ngodech</i>
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>

9. Over the past year, list the most popular marine animals your household collectively caught or harvested, how many, and indicate if these animals are different compared to five years ago? **Tia el mlo merek el rak, ng ngera el ngikel, cheled me a charm er a kereker (daob) a oblechoel el melai? E locha mle uangera ildisel? E betok ng mekesai er a cheim el rak er a mla me mong?(PI3)**

Catch		Compared to five years ago		Harvest		Compared to five years ago	
Name <i>Ngakl</i>	Number <i>Ildois</i>	Same type <i>Osisiu el bedengel</i>	Different type <i>Kakerous el bedengel</i>	Name <i>Ngakl</i>	Number <i>Ildois</i>	Same type <i>Osisiu el bedengel</i>	Different type <i>Kakerous el bedengel</i>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>

10. Are there any threats to catch or harvest? **Ng ngar ngii a sebecel uchul e ng mo nguemed a ika el ngikel, cheled me a charm er a kereker (daob)? (PI3, PI11)**

☐ No

☐ Yes → Can you list up to two top threats? _____

Ng sebecem el masech a teblong el uchul?

Can you list up to two top solutions? _____

Ng sebecem el masech a teblong el sebecheklel?

The following questions are only applicable if the interviewee and/or members of their household grow crops (if not, move to Question 15)

☐ **Select this box if the following questions are not applicable**

11. Over the past year, which crops did your household collectively grow? (select all that apply) **Tia el mlo merek el rak e ngera el dellomel a omullalem? (PI3)**

<input type="checkbox"/>	Taro Dait/Brak	<input type="checkbox"/>	Coconut Lius	<input type="checkbox"/>	Garden vegetables Yasai
<input type="checkbox"/>	Tapioca Diokang	<input type="checkbox"/>	Sweet potato Chemutii	<input type="checkbox"/>	Fruit trees Rodech
		<input type="checkbox"/>	Betel nut Buuch	<input type="checkbox"/>	Other _____

12. Over the past year, what percentage of each input did your household use on its crops? (select all that apply to add up to 100% or if None then put 0%) Tia el mlo merek el rak e ngera el koeas e uangerang a klungel (tela el basent) a omuluusbech er a omelalem a dellomel? (PI3)

Fertilisers	
Animal manure Dechil a charm	
Inorganic fertiliser (chemicals) Koeas er a Ngebard	
Green manure (weeds) or compost Ramk	
Seagrasses Char	
Other _____	
	100%

13. Over the past year, have any pesticides been used on your household crops? Tia el mlo merek el rak, ng ngar er ngii a spray er a charm er a dellomel el bla mousbech er a dellemel? (PI3)

<input type="checkbox"/>	No Diak	<input type="checkbox"/>	Yes Choi
--------------------------	-------------------	--------------------------	--------------------

14. Are there any threats to farming crops? Ng ngar er ngii a uchul e ng mo smecher a lechub e ng mad a dellemel? (PI3, PI11)

☐ No

☐ Yes → Can you list up to two top threats? _____

Ng sebechem el masech a teblong?

Can you list up to two top solutions? _____

Ng sebechem el masech a teblong el kerul a lechub e ng sebecheklel?

15. Over the past year, what percentage of the total amount of catch and harvest, and crops grown by your household would be for the following purposes (select all that apply to add up to 100% or if None then put 0%): (PI3) Tia el mlo merek el rak, ng tela el basent er a cheldmiu me a dellemeliu a mo usbechall er a ika el teletael el beldukl er eou:

Catch		Harvest		Crops	
Eating Blengur		Eating Blengur		Eating Blengur	
Selling Makit		Selling Makit		Selling Makit	
Giving Away Omekang		Giving Away Omekang		Giving Away Omekang	
Family Custom Mechesang		Family Custom Mechesang		Family Custom Mechesang	
	100%		100%		100%

16. Indicate where your household water comes from: (select all that apply) (PI5) A imeliu el ralm ng ngar ker el mei?

<input type="checkbox"/>	Stream or river Omoachel	<input type="checkbox"/>	Household rainwater tank Tank er a blai	<input type="checkbox"/>	Village wells or taps Chido er a beluu
<input type="checkbox"/>	Spring Madedok	<input type="checkbox"/>	Village rainwater tanks Tank er a buai	<input type="checkbox"/>	Other _____ Kuk bebil

17. Does your household have access to safe drinking water and/or access to water for general use? (P15) **A delengcheklem ng ngar ngii a roel a ungil el ralm el ilumel me a dousbech er a blai el me er ngii?**

Safe drinking water Ungil ilumel el ralm		General use water Ralm el dousbech	
Yes Choi	<input type="checkbox"/>	Yes Choi	<input type="checkbox"/>
Sometimes Al Bebil	<input type="checkbox"/>	Sometimes Al Bebil	<input type="checkbox"/>
No Diak	<input type="checkbox"/>	No Diak	<input type="checkbox"/>

SECTION FOUR: Views on the Conservation Area(s) Klemengei me a Osengem er a Blul el Basio

18. Which of the following have you heard of? (select all that apply) (MC8) **Ke mla remenges a chisel a ika el beldukl er eou? Mlecha olangch er a ike el rokui el modengei.**

<input type="checkbox"/>	Micronesia Challenge	<input type="checkbox"/>	Protected Areas Network	<input type="checkbox"/>	Bul	<input type="checkbox"/>	State Conservation Area(s)
--------------------------	----------------------	--------------------------	-------------------------	--------------------------	-----	--------------------------	----------------------------

19. Can you list the allowable activities in the Conservation Area(s)? (MC8) **Ng sebechem el masech a sebeched el meruul er a chisel a blul el basio er a beluam.**

<input type="checkbox"/>	No, <u>none</u> of them Diak	<input type="checkbox"/>	Yes, <u>some</u> of them Choi, medengei a bebil	<input type="checkbox"/>	Yes, <u>all</u> of them Choi, medengei el rokui
--------------------------	----------------------------------------	--------------------------	-----------------------------------------------------------	--------------------------	-----------------------------------------------------------

20. Do you know why the Conservation Area(s) in your State were established? (MC8) **Ke medengei el kmo ng ngera uchul e ng mlekedmokl a blul el basio er a beluam?**

<input type="checkbox"/>	No Diak	<input type="checkbox"/>	Yes Choi
--------------------------	-------------------	--------------------------	--------------------

21. Indicate your level of knowledge about the purpose of each of the following: (MC8) **Mleliang a olangch el olechotel a delechel a klemengei er kau er a ika el beldukl er eou:**

	Extensive level of knowledge Dmolech el klemengei	High level of knowledge Medengei a betok	Medium level of knowledge Medengei a bebil	Limited knowledge Oumededenger	No knowledge Diak kudengei
Micronesia Challenge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Protected Areas Network	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bul	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State Conservation Area(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. Have you and/or any members of your household seen, read and/or participated in any outreach or awareness activities related to the Conservation Area(s)? (MC8) **Ng mla ta el om mesang ke oiuii, ke ngar er a miting me a lechub a cheldechaduch el olisechakl a teletelel a blul el basio er a beluam?**

<input type="checkbox"/>	No, <u>none</u> of them Dirkak	<input type="checkbox"/>	Yes, <u>some</u> of them Mla ngar er a bebil	<input type="checkbox"/>	Yes, <u>many</u> of them Kmal betok
--------------------------	------------------------------------------	--------------------------	--------------------------------------------------------	--------------------------	-----------------------------------------------

If Yes, select which ones (select all that apply): A le ngar er ngii, e mlecha olangch er a ngii er a ika el beldukl er eou.

<input type="checkbox"/>	Fact sheets Babier er a sodel a charm, dellomel, basio, me abebil el tekoi er a science el kirel a blul el basio	<input type="checkbox"/>	Student field education programs Omesarch me a omesuub er a skuul	<input type="checkbox"/>	Other _____
<input type="checkbox"/>	Awareness print materials Babier el mesaod, omeklatk e omeketakl a teletelel me a llechul a blul el basio	<input type="checkbox"/>	Education and/or Awareness Plans Plan me a lechub e ng babier el smaod a telbiil, ureor, okedmeklel, omengkerengel, me a osisecheklel a blul el basio.	<input type="checkbox"/>	Other _____

23. Indicate your level of support for each of the following: (MC9) **Kau mleliang a olangch er a kmo koumerang e oldubech a ika el beldukl er eou:**

	Extensive level of support Dmolech el klaumerang e oldubech	High level of support Kmal oumerang e oldubech	Medium level of support Kuumerang e oldubech	Limited support Diak sa el oumerang e oldubech	Do not support Diak kuumerang me a ka kuldubech
Micronesia Challenge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Protected Areas Network	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bul	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State ConservationArea (s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

24. Do you think the Marine Protected Area (s) have changed the following for your household? (PI4) A blul el basio er a kerker, ngar ngii a blal ngedechii er a delengcheklem?

- If No, mark ‘not changed’ box. A lak e mleliang a olangch er a “dirkak a mengodech”
- If Yes, has it increased or decreased the items listed? Greatly/Somewhat? A le ngar er ngii e mleliang a olangch er a klungel a mla mengodech er a ika el beldukl er eou.

	Greatly Increased Kmal klou	Somewhat Increased Telkib el klou	Not Changed Dirkak a mengodech	Somewhat Decreased Telkib mla ongesngesii	Greatly Decreased Kmal klou a bla losengesii	Don't Know Ngaukai
Overall <u>quality</u> of the <u>marine environment</u> Klungiolel a kerker	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Abundance</u> of <u>fish</u> Ildisel a ngikel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Abundance</u> of <u>invertebrates</u> Ildisel a cheled	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Size</u> of <u>fish</u> Meklungel a ngikel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Size</u> of <u>invertebrates</u> Meklungel a cheled	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Availability</u> of food from <u>fish</u> Ildisel a odoim el ngikel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Availability</u> of food from <u>invertebrates</u> Ildisel a kall el cheled	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Spiritual</u> and <u>cultural amenity</u> Nglsecheklel a klebelau me a tekoi el chelid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

25. *If applicable*, do you think that the Terrestrial Conservation Area (s) have changed the following for your household? (MC1, PI1, PI2, PI7) A omomdasu e a blul el basio er a beluu ng ngar ngii a bla el ngedechii er a delengcheklem?

- If No, mark ‘not changed’ box. A lak e mlelia olangch er a “Dirkak a mengodech”
- If Yes, has it increased or decreased the items listed for your household? Greatly/Somewhat? A le ngar er ngii e mlecha olangch er a klungel a mla mengodech er a ika el beldukl er eou:

	Greatly Increased Kmal klou	Somewhat Increased Telkib el klou	Not Changed Dirkak a mengodech	Somewhat Decreased Telkib mla ongesngesii	Greatly Decreased Kmal klou a bla losengesii	Don't Know Ngaukai	Not applicable
Overall <u>quality</u> of the <u>terrestrial environment</u> Klungiolel a beluu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Abundance</u> of <u>fruit bats</u> Ildisel a olik	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Abundance</u> of <u>medicinal plants</u> Ildisel a dellomel el kar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Abundance</u> of <u>building materials</u> Ildisel a klalo el kerrekar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Size of <u>fruit bats</u> Meklungel a olik	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Size of <u>building materials</u> Meklungel a klalo el kerrekar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of <u>farm food (crops)</u> Ildisel a delomel el kall (ongraol me a yasai)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of public <u>freshwater</u> Klungiolel a ralm er a beluu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quantity of public <u>freshwater</u> Ildisel a ralm er a beluu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Spiritual</u> and cultural amenity Nglsecheklel a klebelau me a tekoi el chelid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

26. Indicate if you agree (and the level to which you do) with the below statements: (PI3, PI11, MC4)
Mleliang a olangch el kmo ke kongei a lechub e ng diak er a ika el beldukl er eou:

Statements Tekoi	Very strongly agree Ak mal mui el kongei	Strongly agree Choi ak kongei	Moderately agree Ou ralm sils	Agree a little Oumededengei	Do not agree Diak moldubech	Don't know Diak Kudengei
Overall, the Conservation Area(s) has been <u>beneficial</u> to our community A ika el blul el basio a ngar er ngii al relii er a beluad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I often <u>see or hear</u> about illegal entry or <u>taking of resources</u> from the Conservation Area(s) Ak blechoel mesterir e remenges a chisir a re mo soiseb me a re melemall a llechul a blul el basio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There is <u>adequate enforcement</u> of the <u>rules</u> of the Conservation Area(s) Ng ungil a otutel a llechul a blul el basio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There is <u>adequate monitoring</u> of the <u>natural resources</u> in our community Ng ungil a klekerngel (monitoring) a dikesel a beluu (natural resources)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There have been <u>positive livelihood</u> <u>benefits</u> due to the Conservation Area(s) A ika el blul el basio a uchul a ungil omenged, omelngot, omengerker me a ungil el klengar.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There have been <u>positive economic</u> <u>benefits</u> due to the Conservation Area(s) A ika el blul el basio a dirrek el	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

uchul a ungil kerruul el me er a beluu						
There have been <u>positive cultural and spiritual benefits</u> due to the Conservation Area(s) A blul el basio a uchul a ngecheklel a klebelau me a tekoi el chelid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There have been <u>positive environmental benefits</u> due to the Conservation Area (s) A ika el blul el basio a msa klungiolel a beluu me a kerker	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Everyone <u>benefits equally</u> from the Conservation Area(s) A klungiaol el mengai er a ika el blul el basio a tabesul e oberk el mo er a dertang el chad er a beluu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If we want to preserve our natural resources then <u>'closing off' certain areas is necessary</u> <u>Al sekum e ng soad el mengeluoluo a dikesed e ng kired el osimer/omul a bebil er a basio</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION FIVE: Views on the Local Management Plan

For Ngaraard State

1. Can you tell us the name of the State Conservation Areas? **Ke medengelii a ngklel a conservation area me a lechub e ng blul el basio er kemiu?** (only select 'Yes' if they correctly state it) (Goal 2)

	Yes	No
<i>West Coast Mangrove Conservation Area</i>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Ungellel Conservation Area</i>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Ngerkall Lake and Metmellasech Watershed Conservation Area</i>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Diong Era Ngerchokl Conservation Area</i>	<input type="checkbox"/>	<input type="checkbox"/>

2. Do you know the official boundaries for these Local Conservation Areas? **Ke medengelii a kerrengsel tia el blul el basio el kmo ng nga er ker el mo er ker?** (Goal 2)

	Yes	No
<i>West Coast Mangrove Conservation Area</i>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Ungellel Conservation Area</i>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Ngerkall Lake and Metmellasech Watershed Conservation Area</i>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Diong Era Ngerchokl Conservation Area</i>	<input type="checkbox"/>	<input type="checkbox"/>

3. Indicate your level of support for the following new sustainable livelihood opportunities for the local community. **Ke oldubech a ikang el tekoi er a kerruul me a omengerker el mei er a beluu:** (Goals 5, 5-1, 5-2, 5-3, 5-4)

	Extensive level of support Dmolech el klaumerang e oldubech	High level of support Kmal oumerang e oldubech	Medium level of support Kuumerang e oldubech	Limited support Diak sa el oumerang e oldubech	Do not support Diak kuumerang me a ka kuldubech
Development of eco-friendly programs for Ngaraard's Conservation Areas for locals and tourism industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nature trail at Ngerchokl for guided tours. Okedmeklel a ungil el teletael er a tourist, blil a omilil, omesuub me a omesarch el me er a ika el blul el basio.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Areas for camping and hiking. Basio el sebeched el camp me a lechub e ke de hike.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More guided tours and trails, including tours that showcase medicinal and endemic plants. Okedmeklel a oreomel el kuk molecholt a kerud me a kerrekerud.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If there are any other comments, please write them here: